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09/772,994	01/31/2001	Masashi Morizane	P107336-00016	8286

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EXAMINER	
MUTSCHLER, BRIAN L	

ART UNIT	PAPER NUMBER
1753	16

DATE MAILED: 02/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/772,994	MORIZANE ET AL.	
	Examiner	Art Unit	
	Brian L. Mutschler	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 7-10* is/are rejected.

7)☒ Claim(s) *6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 16, 2002 has been entered.

Terminal Disclaimer

2. The terminal disclaimer filed on December 16, 2002, disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of copending Application No. 09/788,339 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Comments

3. The objection to the specification has been overcome by Applicant's amendment submitted December 16, 2002.

4. The rejection of claim 7 under 35 U.S.C. 112 2nd paragraph has been overcome by Applicant's amendment.

5. The provisional rejection of claims 1-9 under the judicially created doctrine of obviousness-type double patenting has been overcome by the terminal disclaimer filed on December 16, 2002.

6. Upon further reconsideration and in light of Applicant's response, the rejection of claim 6 under 35 U.S.C. 103 has been withdrawn. While Yamagishi et al. and Haigh et al. both disclose modules comprising water prevention layers, the combination of the references would not have been obvious to one skilled in the art because the coplanar layer of Haigh et al. enables the device to be used without the encapsulant. Therefore, no motivation for using layer in an encapsulated module would exist.

7. The rejection of claim 10 has been modified below to more clearly explain the combination of the references by providing an additional reference disclosing the use of a combination of a resin layer and a glass plate.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in-

> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

9. Claims 1-3 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamagishi et al. (U.S. Pat. No. 6,300,556).

Yamagishi et al. show a solar cell module that has a sodium containing light transmitting member **1**, a rear surface resin film **8** and a plurality of solar cell elements sealed with sealing resin **9** between the front member **1** and the rear surface member **8** (col. 3, line 18; col. 4, line 14; fig. 1). In the solar cell module of Yamagishi et al., the rear surface resin film **8** also functions as the water transmission preventing layer (col. 5, line 59). The light transmitting member **1** is made of soda lime glass, and the rear surface resin film **8** is a transparent resin film made of PVF (col. 7, line 29; col. 8, line 67). The rear surface resin film **8** has a water vapor transmission rate (WVTR) smaller than the WVTR of the EVA sealing resin **9** (see p. 22, line 8 of the instant application for WVTRs).

Regarding claim 7, the rear surface resin film **8** covers the interval part between adjacent solar cell elements (fig. 1).

Since Yamagishi et al. teach the limitations of the instant claims, the reference is deemed to be anticipatory.

10. Claims 1-3 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Kondo (U.S. Pat. No. 6,271,053).

Kondo shows a solar cell module comprising a light transmitting member **1** on a front surface side containing sodium, a rear surface resin film **9**, a plurality of solar cell elements **11** sealed with a sealing resin **8** (col. 6, line 58; col. 7, line 31; fig. 1). The rear surface resin film **9** also serves as a water transmission preventing layer (col. 2, line 18). The light transmitting member **1** is made of soda lime glass, and the rear surface resin film **9** is a transparent resin film made of PVF (col. 2, line 18; col. 6, line 58). The rear surface resin film **9** has a water vapor transmission rate (WVTR) smaller than the WVTR of the EVA sealing resin **8** (see p. 22, line 8 of the instant application for WVTRs).

Regarding claim 7, the rear surface resin film **9** covers the interval part between adjacent solar cell elements (fig. 1).

Since Kondo teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-3, 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dran et al. (U.S. Pat. No. 4,321,418) in view of Yamagishi et al. (U.S. Pat. No. 6,300,556).

Regarding claim 1, Dran et al. disclose a solar cell module comprising a plurality of solar cells **2** sealed within a sealing resin **5** (fig. 3; col. 3, lines 3-20). The module further comprises a light transmitting member **6** on a front surface side and a rear surface resin film **9** (fig. 3; col. 3, lines 3-16). A fluid-tight sheet **7** is formed on a surface of the rear surface resin film **9** (fig. 3; col. 3, lines 3-16). The fluid-tight sheet **7** is arranged in a position that covers the interval part between adjacent solar cells **2** (fig. 3).

Regarding claim 2, the light transmitting member **6** can be comprised of glass and the rear surface resin film **9** can be made of a transparent resin film (col. 3, lines 3-20).

Regarding claim 3, the fluid-tight sheet **7** can be made of glass, which has a water transmission rate of zero, which would be smaller than that of the rear surface resin film (col. 3, lines 3-20).

Regarding claim 5, the fluid-tight sheet **7** can be a comprised of glass and is bonded to a surface of the rear surface side film **9** (fig. 3; col. 3, lines 3-20).

Regarding claims 7 and 8, the fluid-tight sheet **7** is positioned to cover the interval part between adjacent solar cells **2** and is formed on the outer side of the rear surface side film **9** (fig. 3).

The solar cell module of Dran et al. differs from the instant invention because Dran et al. do not disclose the presence of sodium in the light transmitting member.

Yamagishi et al. show a solar cell module that has a sodium containing light transmitting member **1**, a rear surface resin film **8** and a plurality of solar cell elements sealed with sealing resin **9** between the front member **1** and the rear surface member **8** (col. 3, line 18; col. 4, line 14; fig. 1). In the solar cell module of Yamagishi et al., the rear surface resin film **8** also functions as the water transmission preventing layer (col. 5, line 59). The light transmitting member **1** is made of soda lime glass, which is an inexpensive glass commonly used in solar cell modules (col. 7, line 29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the glass used in Dran et al. to use soda lime glass as taught by Yamagishi et al. because soda lime glass is an inexpensive glass often used in solar cell modules.

13. Claims 4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. Pat. No. 6,300,556) in view of Otani et al. (PG-Pub 2001/0009160 A1).

Yamagishi et al. disclose a solar cell module having the limitations recited in claim 1, as explained above in section 9.

Yamagishi et al. do not disclose the use of an inorganic oxide layer, a nitride layer or a fluoride layer formed on a surface of the rear surface resin film, as recited in the limitations of claim 4 of the instant invention.

Otani et al. teach the use of an inorganic oxide layer on a transparent resin film because "a coating of inorganic oxide is preferably used as a moistureproof layer" over metal layers, which have "a possibility of current leakage" (par. [0042]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided an inorganic oxide layer on the rear surface resin film of Yamagishi et al. because inorganic oxide layers create moistureproof layers while eliminating the possibility of current leakage, as taught by Otani et al. (par. [0042]).

With respect to claim 9, Yamagishi et al. disclose a water transmission preventing layer that is the rear surface resin film. However, Yamagishi et al. do not disclose the layer having a WVTR no higher than 6.3g/m^2·day, as recited in claim 9 of the instant invention.

Otani et al. disclose a resin film that is made of PET to a thickness of 250μm, which corresponds to a WVTR of 2.5g/m^2·day (par. [0044]).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the solar cell module of Yamagishi et al. to use the resin film of Otani et al. as the rear surface resin film because the resin film taught by Otani et al. has a very low WVTR, which would help prevent against performance degradation due to water absorption.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. Pat. No. 6,300,556) in view of Jansen et al. (U.S. Pat. No. 6,077,722).

Yamagishi et al. disclose a solar cell module having the limitations recited in claim 1, as explained above in section 9. Yamagishi et al. do not disclose the use of a glass water transmission preventing layer bonded to the surface of the rear surface resin film, as recited in the limitation of claim 5 of the instant invention.

Jansen et al. teach the use of a glass rear layer **44** bonded to a rear resin surface film **46** to "provide enhanced environmental protection for the photovoltaic module" (col. 5, line 27; col. 8, line 61; fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the solar cell module of Yamagishi et al. using the glass water transmission preventing layer taught by Jansen et al. because the glass layer would "provide enhanced environmental protection for the photovoltaic module" (col. 5, line 27).

15. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. Pat. No. 6,300,556) in view of Matsushita et al. (U.S. Pat. No. 6,222,118).

Yamagishi et al. disclose a solar cell module having the limitations recited in claim 1, as explained above in section 9. Yamagishi et al. do not disclose providing the water transmission preventing layer on an outer side of the rear surface resin film.

Matsushita et al. teach the use of waterproof films **56**, **57** on the outer side of each substrate **21**, **22** (col. 7, line 61). The waterproof films **56**, **57** are used to prevent the substrates **21**, **22** from absorbing water (col. 8, line 5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell modules of Yamagishi et al. to use water transmission preventing layers on an outer side of the rear surface resin film because having a water transmission preventing layer on an outer side of the rear film would prevent the rear film from absorbing water, as taught by Matsushita et al. (col. 8, line 5).

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamagishi et al. (U.S. Pat. No. 6,300,556) in view of Van Andel et al. (U.S. Pat. No. 6,184,057), in view of Yamada et al. (U.S. Pat. No. 6,113,718) and in view of Pollard (U.S. Pat. No. 6,034,322).

Yamagishi et al. disclose a solar cell module having the limitations recited in claim 1, as explained above in section 9. The device of Yamagishi et al. differs from the instant invention because Yamagishi et al. do not disclose the use of a glass plate having a thickness of 0.005 to 0.1 mm as a water transmission preventing layer.

Yamada et al. disclose a solar cell module comprising a surface material and a filler, wherein the surface material is comprised of a glass coated with a fluororesin (col. 13, lines 47-52). Yamada et al. teach, "It is important that the surface material is stable against heat, light and water" (col. 13, lines 32-34).

Pollard discloses the use of thin cover glass having a typical thickness of 75 μm to 150 μm (0.075 to 0.15 mm) (col. 4, lines 58-67). Thicker glass layers are "significantly stronger" and "thinner glass is desired for other considerations as mass reduction" (col. 4, lines 58-67).

Van Andel et al. disclose a flexible solar cell having a glass protective window with a thickness of 100 to 200 nm (0.0001 to 0.0002 mm) (col. 6, lines 16-21).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the rear surface resin film of Yamagishi et al. to use a rear surface member comprised of a fluororesin-coated glass as taught by Yamada et al. because a fluororesin-coated glass rear surface member would provide greater protection against water.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell of Yamagishi et al. to use a glass layer having a thickness between 0.005 and 0.1 mm, because Pollard and Van Andel teach the use of thin cover glass to protect the solar cell and Pollard further teaches that thicker glass is "significantly stronger" and "thinner glass is desired for other considerations as mass reduction" (US '322 col. 4, lines 58-67). One skilled in the art would choose the thickness of the glass based on the desired properties of the finished solar cell module, such as increased structural strength or decreased weight.

17. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dran et al. (U.S. Pat. No. 4,321,418) in view of Yamagishi et al. (U.S. Pat. No. 6,300,556), as

applied above to claims 1-3, 5, 7 and 8, and further in view of Pollard (U.S. Pat. No. 6,034,322).

Dran et al. and Yamagishi et al. describe a solar cell module having the limitations recited in claims 1-3, 5, 7 and 8 of the instant application, as explained above in section 12.

The solar cell module described by Dran et al. and Yamagishi et al. differs from the instant invention because they do not disclose the use of a glass sheet having a thickness between 0.005 and 0.1 mm, as recited in claim 10.

Pollard discloses the use of thin cover glass having a typical thickness of 75 μm to 150 μm (0.075 to 0.15 mm) (col. 4, lines 58-67). Thicker glass layers are "significantly stronger" and "thinner glass is desired for other considerations as mass reduction" (col. 4, lines 58-67).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the solar cell of Yamagishi et al. to use a glass layer having a thickness between 0.005 and 0.1 mm, because Pollard teaches the use of thin cover glass to protect the solar cell and Pollard further teaches that thicker glass is "significantly stronger" and "thinner glass is desired for other considerations as mass reduction" (US '322 col. 4, lines 58-67). One skilled in the art would choose the thickness of the glass based on the desired properties of the finished solar cell module, such as increased structural strength or decreased weight.

Respons to Arguments

18. Applicant's arguments filed December 16, 2002 have been fully considered but they are not persuasive.

19. Regarding Applicant's arguments of the rejection of claims 1-3 and 7 under 35 U.S.C. 102, Applicant has stated that "the present invention includes a *separate* rear surface resin film and a separate water transmission prevention layer" (see page 4of Applicant's response; emphasis added by Examiner). This argument is invalid. First of all, claim 9 recites the limitation that "the water transmission preventing layer is the rear surface resin film." This limitation requires claim 1 to be capable of having a single resin film that it both the rear surface resin film and the water transmission preventing layer, otherwise claim 9 would not be possible without deleting a feature of the claim from which it depends. Furthermore, in the specification on page 25 at lines 3-11, it states "the rear surface resin film...can function as a water transmission preventing layer". In light of claim 9 and the specification, the claimed invention can have a rear surface resin film that is the water transmission preventing layer. Therefore, both Yamagishi et al. and Kondo et al. anticipate the claimed invention. Second, Yamagishi et al. further disclose that the rear surface resin film can be a single film or a laminate of films (col. 5, lines 59-63).

20. Applicant also argues that Yamagishi et al. do not disclose the water transmission film including at least an interval part between the solar cell elements adjacent each other (see pages 4-5 of Applicant's response). Figures 1-5 clearly show

the protective layer covering the entire module, including the solar cells and the spaces between the cells.

21. Regarding the rejection of claims 4 and 9, Applicant has argued "there is no teaching or suggestion that the moistureproof layer of Otani is preferable over that of Yamagishi" (see page 6 of Applicant's response). Otani (PG-PUB '160) teaches that inorganic layers are preferred water prevention layers as opposed to metal layers because metal layers have a possibility of current leakage. Therefore, it would have been obvious to modify the protective film of Yamagishi, which can comprise a laminate with an aluminum layer, to use an inorganic layer in place of the aluminum layer because it avoids the potential current leakage. Since Otani teaches the use of an inorganic layer and provides motivation for using the layer, it would have been obvious to one skilled in the art to use the inorganic layer in the device of Yamagishi. Furthermore, the substitution of a known material for its intended use is an obvious modification to one skilled in the art (see MPEP §2144.07).

22. Regarding the rejection of claim 5, Applicant has argued that "it is unclear as to why one of ordinary skill in the art would be compelled to replace the water transmission preventing layer of Yamagishi, as suggested, with the glass water transmission preventing layer, as taught by Jansen" (see page 8 of Applicant's response). As explained in the rejections set forth, Jansen teach that the combination of a glass and resin layer "provide[s] enhanced environmental protection for the photovoltaic module" (col. 5, lines 24-29). Furthermore, as stated above, the substitution of a known material for its intended use is an obvious modification for one skilled in the art.

23. Regarding claim 8, Applicant has argued that using a water preventing sheet would "change the principle of operation" of Yamagishi et al. (Response, page 20). In light of the fact that Yamagishi et al. disclose the use of a laminated film as the rear surface protective layer, it is not clear how the placement of the water preventing layer would change the principle of operation. Both of the different layers disclosed in the laminate of Yamagishi et al. can function as either the rear surface protective film or the water preventing film. Therefore, either placement would function in an equivalent manner.

24. Regarding claim 10, Applicant has suggested, "There is no motivation for making the water transmission prevention layer of Yamagishi a glass plate having a thickness of 0.005-0.1 mm" (see page 11 of Applicant's response). The use of a glass plate formed with a resin film is a known water-preventing surface protection means, as taught by Yamada et al. and Jansen et al. The thickness of the glass plate is a results effective variable, as demonstrated by Van Andel and Pollard. Pollard specifically teaches that thicker glass layers are "significantly stronger" and "thinner glass is desired for other considerations as mass reduction" (col. 4, lines 58-67). Since the thickness is a design criteria selected for the desired properties and the claimed thickness are known in the art and have been demonstrated to be used thickness, it is deemed that the selection of such glass thicknesses would have been obvious to one skilled in the art.

Allowabl Subject Matter

25. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record does not teach or suggest the use of a water transmission prevention layer in a solar cell module that is formed on the same plane as the solar cell modules, i.e., the water transmission prevention layer is coplanar with the solar cells within the module and within the sealing resin.

Conclusion

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (703) 305-0180. The examiner can normally be reached on Monday-Friday from 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (703) 308-3322. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

blm
February 14, 2003